Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-51 are pending in the application, with claims 1, 40 and 48 being independent claim.

Based on the above amendment and the following Remarks, Applicants respectfully request that the examiner reconsider all outstanding objections and rejections and they be withdrawn. Attached hereto is a marked-up version of the changes made to the specification including claims by the current Amendment. The attachment is captioned "Version with Markings to Show Changes Made."

Allowable Subject Matter

On page 5 of the Office Action, the Examiner noted that claims 13-16, 23-26, 28-29, 31-34 and 41-43 would be allowable if rewritten in independent form.

Rejections Under 35 U.S.C. § 102

On page 2 of the Office Action, the Examiner rejected claims 1, 40 and 47- 51 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,473,455 issued to Koike *et al.* ("Koike"). This rejection is respectfully traversed.

On page 2 of file Office Action, the Examiner regards the portion (22d) in Fig. 50 of Koike et al. as a corresponding element to an aperture of claim 1, 40 and 47-50 of the present

application. However, the portion (22d) is not an aperture but just a "depressed" portion as described in Fig. 50 and lines 27-30 of col. 20 of Koike. The term "aperture" commonly means "an opening or an open space", as described in Merriam Webster's Collegiate Dictionary. Therefore, the depressed portion (22d) of Koike cannot be considered as an aperture of claims 1, 40 and 47-50 of this application. Hirata also uses the term "opening" (48 in Fig, 22) for indicating the structure similar to that of the present invention.

Regarding claim 40, Koike does not disclose a wedge-shaped protrusion or a wedge-shaped aperture. Koike neither discloses altemately arranged protrusions and apertures. Instead, Koike merely shows a projected portion (22p) and an oppositely (or "correspondingly") depressed portion (22d) as illustrated in Fig. 50 and lines 24-31, col. 20.

Regarding claim 47, Koike does not disclose a liquid crystal layer having negative dielectric anisotropy. Furthermore, Koike does not disclose four domains having different tilt directions due to the apertures and the protrusions.

Regarding claim 48, Koike et al. does not disclose altemately arranged protrusions and apertures. Accordingly, claims 1, 40 and 47-50 are patentable over Koike.

Rejections Under 35 U.S.C. § 103

On page 3 of the Office Action, the Examiner rejected claims 2-12, 17, 22, 27, 30, 37-39 35 U.S.C. §103(a) as being anticipated by Koike. This rejection is respectfully traversed.

On page 3 of the Office Action, the Examiner stated that, "Koike et al disclose the claimed invention except for" the chiral nematic liquid crystal layer, the polarizing sandwiching

the LCD cell, the compensation films, the cross shape of the aperture, and the black matrix. However, Koike does not disclose an aperture of the present invention, as discussed previously. Furthermore, regarding claim 2 and 3 of the present application, Koike does not disclose a liquid crystal layer having negative dielectric anisotropy and liquid crystal molecules aligned perpendicular to the substrates.

Accordingly, claims 2-12, 17, 22, 27, 30 and 37-39 are patentable over Koike.

On page 4-6 of the Office Action, the Examiner rejected claims 1-12, 17-22, 27, 30, 35-40 and 44-51 under 35 U.S.C. §103(a) as being unpatentable over Koike or over U.S. Patent No. 5,935,093 issued to Hirata, et al. ("Hirata"), in view of Koike. This rejection is respectfully traversed.

On pages 4 and 5 of the Office Action, the Examiner stated "Koike et al disclose an LCD which formed on one substrate as well as apertures which formed on another substrate". However, as described before, Koike does not disclose an aperture of the present invention.

Accordingly, claims 2-12, 17, 22, 27, 30 and 37-39 are patentable over Hirata and Koike.

Other Matters

On page 5 of the Office Action, the Examiner noted that claims 13-16, 23-26, 28-29, 31-34 and 41-43 would be allowable if rewritten in independent form. As previously argued, claims 1 and 40 are believed to be patentable. Therefore, claims 14-16, 23-26, 28-29 and 31-34 are allowable because they are now dependent from patentable claim 1. Likewise, claims 41-43 are also allowable because they are now dependent from patentable claim 40.

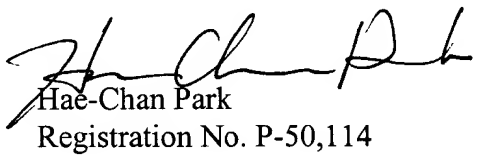
As such, it is respectfully requested that all the rejections and objections over claims 1-51 be withdrawn and pass those claims to issuance.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



Hae-Chan Park
Registration No. P-50,114

McGuire Woods LLP
1750 Tysons Boulevard
Suite 1800
McLean, VA 22102-4215
(703) 712-5000

Version with Markings to Show Changes Made

Amendments

In the Specification:

On page 15, line 4, please change "200" into – 10 –:

Compensation films 133 and 233 are interposed between polarizer 13 and 23 and the substrates 20 and 10[200] respectively. One of the compensation films may be an a-plate compensation film and the other a c-plate compensation film. Otherwise, both the compensation films may be c-plate compensation films. A biaxial compensation film may be used instead of the uniaxial compensation film, and, in this case, the biaxial compensation film may be attached to only one substrate. The slow axis, which is the direction having a largest refractive index, of the a-plate or the biaxial compensation film may be parallel or perpendicular to the polarizing directions of the polarizers 13 and 23.

Page 15, line 20, change "compare" into – compared –.

Furthermore, since the protrusions 170 are formed on the color filter 120 and it is not necessary to etch the common electrode (not shown), the manufacturing process of the color filter substrate is simple compared with the first embodiment. In addition, since the lower substrate does not have protrusions, the manufacturing process of the lower substrate is simple compared [compare] with the second embodiment.

Page 16, line 5, change "FIG. 6" into – FIG. 5 –.

Now, the third embodiment of the present invention will be described with reference to FIG. 5 [FIG. 6] showing a pixel having patterns for four domains.

Page 17, line 19, change "ththe" into – the –.

The shapes of the patterns are substantially similar to the patterns of the [ththe] fifth embodiment. That is, a protrusion pattern 170 formed on a color filter substrate and an aperture pattern 270 formed on a TFT substrate have wedge shapes, and the protrusions 170 and the apertures 270 are arranged alternately. The bent portions of the wedge-shaped patterns are placed on the transverse center line passing through the center of a pixel, and have a convex point and a concave point.

Page 25, line 18, change "vertically" into – vertical –.

As shown in FIG. 19D and 19E, a photo-sensitive film such as photoresist or polyimid film is coated on the common electrode 130 with the thickness of 3 to 20 microns, exposed, developed and baked to form a protrusion pattern 170 with 0.3 to 3 micron width. The protrusion pattern 170 may overlap the black matrix 110. Then, a vertical [vertically] alignment layer 140 is coated thereon.

Page 26, line 13, delete "pattern".

Page 26, line 15, change "native" into – negative –.

The TFT and the color filter substrate 10 and 20 formed according to the methods shown in FIG. 19A to 19E and in FIG. 20A to 20D are assembled with each other in a manner that the protrusions 170 and the aperture [pattern] patterns 270 are alternately arranged with a space. After liquid crystal having negative [native] dielectric anisotropy is injected between two substrates, polarizers are attached on the surfaces of the substrates in a manner that the polarizing directions have a right angle each other.

In the Claims:

Please amend claim 1, as follows.

1. (Amended) A liquid crystal display, comprising:

a first substrate;

a common electrode which is formed on the first substrate;

a plurality of protrusions formed on the common electrode;

a second substrate facing the first substrate; and

a pixel electrode having a plurality of [aperture] apertures formed on the second substrate.